

REMARKS

Applicants have carefully considered the June 21, 2005 Office Action, and the comments that follow are presented in a bona fide effort to address all issues raised in that Action and thereby place this case in condition for allowance. Claims 14-24 are pending in this application. Applicants submit that by the present Remarks, this application is placed in clear condition for immediate allowance. Accordingly, entry of the present Remarks, and favorable consideration, are respectfully solicited.

Applicants respectfully request consideration and entry of the Information Disclosure Statement submitted on November 16, 2005, pursuant to 37 C.F.R. 1.97(d).

Claims 14-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yonetsu et al. (U.S. Pat. No. 6,506,513, hereinafter “Yonetsu”) in view of Hockaday et al. (U.S. Pat. App. Pub. No. 2002/0182459, hereinafter “Hockaday”). Applicants respectfully traverse the rejection since neither reference, alone or in combination, discloses or remotely suggests every limitation of independent claim 14. The Examiner has failed to identify where either reference discloses or suggests fuel cell power generation equipment including an air vent hole which has a gas/liquid separation function.

The present claimed subject matter, as described in claim 14, relates to a fuel cell power generation equipment in which an anode for oxidizing liquid fuel, a cathode for reducing oxygen, an electrolyte membrane/electrode assembly (MEA) provided between the anode and the cathode, a fuel container for holding the liquid fuel, and an air vent hole which has a gas/liquid separation function and is provided on a wall surface of a fuel container.

In the equipment of claim 14, at least one air vent hole “has a gas/liquid separation function” so that the fuel container has an omni-directional property. As described in Examples

1-5 of the present specification, since the air hole having a gas/liquid separation function is provided on the surface of the fuel container, even when the fuel cell power generation equipment is turned upside down and the air hole faces downward, the liquid fuel does not spill and the fuel cell power generation equipment can continuously work. Such omni-directionality is very important for use as a portable fuel cell and the like. See page 45, lines 11-15; and page 55, lines 7-13 of the detailed description section of the present specification.

Yonetsu, at col. 5, lines 45-67, discloses a fine hole (6) which adjusts pressure. This fine hole does not let gas (e.g., CO₂) formed by oxidation at an anode go outside of the fuel container, as does the air vent hole(s) in the present claimed subject matter. Indeed, Yonetsu is directed to a laminate type direct methanol fuel cell (DMFC) in which MEAs are laminated approximately in a vertical direction to the surface of MEA. Yonetsu discloses the use of a mechanism for avoiding a negative pressure, i.e., a mechanism for taking in the air from outside the tank in accordance with the flow of the liquid fuel out of the fuel tank. This arrangement prevents the inner pressure of the fuel tank from becoming negative relative to the cell body. The fine hole 6 can be formed as a mechanism against the negative pressure on the side wall in the upper portion of the fuel tank 1 as shown in FIG. 1.

Moreover, the fine hole 6 does not have a gas/liquid separation function. When the fine hole 6 faces downward, the liquid fuel spills. Therefore, in order to turn the fuel vessel upside down, the fine hole has to be closed up or sealed. In this connection, Yonetsu, column 15, lines 26-34, states as follows.

“Further, the fine hole 6 providing a measure against the negative pressure was temporarily closed during the power generating operation, and the liquid fuel tank was quietly turned upside down such that the fuel cell body 2 was positioned on the liquid fuel tank 1 as in Example 2. Then, the other fine hole 6' providing a measure against the negative pressure was released, and the power generation was continued. It has been

found that the power output was rapidly lowered, and it took one hour for the power output to be stabilized again.”

Thus, in Yonetsu, the fine hole 6 has to be closed when the fuel cell is turned upside down and, therefore, it cannot be argued that the fine hole 6 has a gas/liquid separation function. It should be evident that the vent hole of the present claimed subject matter is clearly distinct from the fine hole of Yonetsu in both structure and function. Further, the above described advantage of the claimed subject matter (omni-directionality) is neither recognized nor attained by Yonetsu.

Hockaday discloses a membrane through which gas passes but liquid cannot pass. However, such a membrane is used for supplying a methanol fuel to an electrode of a fuel cell. In the present claimed subject matter, the gas/liquid separation membrane is provided on the wall surface of the fuel container, and used as a vent hole to exhaust gas such as carbon dioxide. Therefore, Hockaday does not disclose or suggest a gas/liquid separation membrane through which gas passes but liquid cannot pass. Applicants submit that Hockaday is entirely irrelevant to the present claimed subject matter.

Hockaday discloses the separation of methanol and hydrogen gas formed by hydrolysis in a fuel container (7) by use of a membrane. Hockaday does not disclose or suggest that gas formed by oxidation at an anode is discharged to outside of a fuel container through air vent hole(s), as required in claim 14. Hockaday discloses a fuel cell which is equipped to vent gasses which occur during power generation in a cell, but the technique separates methanol and hydrogen gas by use of a membrane. See numbered paragraph [0066]. Therefore, Hockaday does not disclose or suggest a gas/liquid separation membrane through which gas passes but liquid cannot pass. Thus, Hockaday is entirely irrelevant to the present claimed subject matter.

Moreover, neither reference discloses or suggests at least one air vent hole that has a gas/liquid separation function and at least one air vent hole that is kept unsealed from the liquid fuel in the fuel container. Thus, neither reference, alone or in combination, teaches each feature of the claimed subject matter. Even if the applied references are combined as suggested by the Examiner, the claimed subject matter would not result. Accordingly, the rejection under 35 U.S.C. § 103 is not legally valid and should be withdrawn.

It is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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